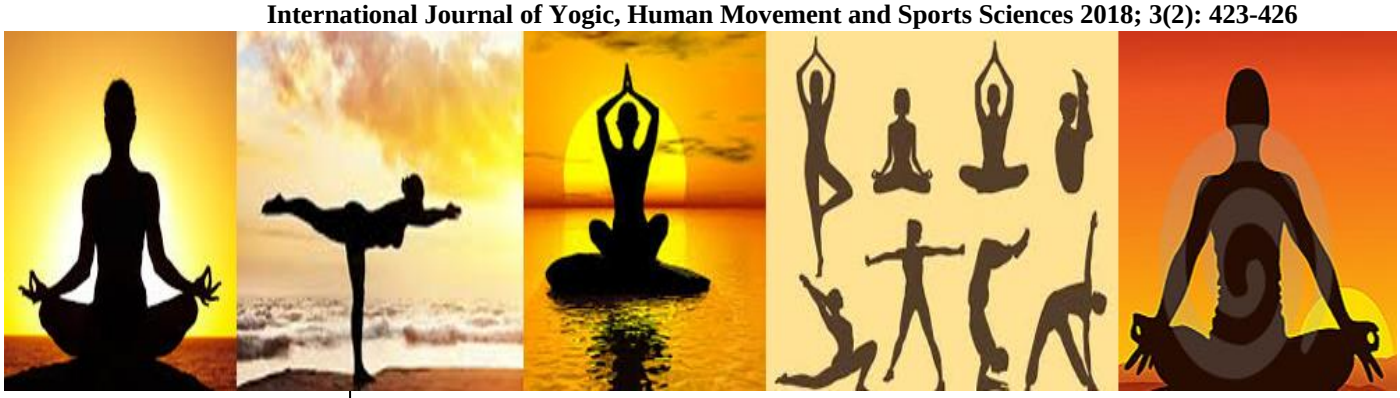
International Journal of Yogic, Human Movement and Sports Sciences 2018; 3(2): 423-426



ISSN: 2456-4419
Impact Factor: (RJIF): 5.18
Yoga 2018; 3(2): 423-426

www.theyogicjournal.com
Received: 04-05-2018
Accepted: 05-06-2018

Ashutosh
Assistant Professor, D.A.V. College, Abohar, Punjab, India

Correspondence
Ashutosh
Assistant Professor, D.A.V. College, Abohar, Punjab, India

Relationship between the anthropometric variables of upper limb with the performance of college level hockey players

Ashutosh

Abstract
The purpose of the study was to know the relationship between anthropometric variables of upper limb to the performance of female hockey player of collegiate level. For achieving the purpose of the study total forty female (n = 40) hockey players were selected as samples from various colleges of Punjabi University, Patiala. All the selected subjects were hockey players of college level. The age of subjects ranged between 17 to 25 years. Various anthropometric measurements were taken on the right side of all the subjects by using the standard technique of Heath and Carter (1967) method. After the collection of relevant data, it was processed and analyzed with descriptive statistics. To find out the relationship between anthropometric variables of upper limb to the performance of hockey players of collegiate level, the data was analysed by applying, multiple correlation and regression analysis with the help of statistical package of SPSS. To test the hypothesis the significance level was set at 0.05 percent. After statistical treatment, result showed that there exists significance relationship between selected anthropometric variables and combination of two or more selected anthropometric variables and performance in hockey.

Keywords: Anthropometric variables, upper limb, performance, hockey players

Introduction
Over the last century, sports have captured an important place in the world. Large population is involved actively in different sports and media has played a very successful role to attract the people towards sports. Human physique plays an important role during execution of movement, skill and technique. The quality of an individual's movement and skill efficiency in terms of its utilization value is directly proportional to his level of performance. Hockey is one of the oldest games in the history. It is considered as a national game of India and has its unique skills & pattern of play. The game of hockey is also not exception to the above facts. Rather, it is more established which is played all over the world by all sections of the people, not only for the methods of play but also very interesting to watch. Hockey is dynamic field team game, played by both sexes, requiring a high level skills, excellent conditioning and well co-ordinate team efforts. Field hockey, a team sport is played comparatively on a large population of players is active participation, while of audience, spectators, coaches, scientists, organizers, national federations and media is secondary participated. The birthday and birthplace of hockey is not known. However, there exists evidence that the ancient Persians loved to chase a ball with sticks carved from hedgerow. The Greeks borrowed the idea from Persians and in turn, passed it on to Romans. It then travelled to France, where it was called "Loquats" which in their language means a shepherd's stick. Eventually, it found its way to Britain. Traces some sort of stick game played by American Aztec Indians was a vigorous from of hockey from thousands years. But neither these nor a "London Balle Player", played in 1175, bear much resemblance to modem hockey. Although the game did not appear in England until much later, yet it was in that country that hockey took its present shape. In the Canterbury cathedral, there is a 600 years old window showing a boy striking a ball with a crooked stick. The modern game of hockey was brought in India by Britons in the early eighties of the last century. India created a history of gold medal in Olympics from 1928 to 1956 India won 6 gold medals continuously then one in 1964 the last was in 1980.

After that Indian hockey face a big downfall. The sports structure in India is fast changing because of the availability of increased facilities in sports environment. Awareness among the coaches and physical educationists towards the recent advances in sports sciences is growing rapidly. The role of an emerging scientific discipline known as sports Sports Anthropometry, is of great significance. It is a science that deals with the body measurements of athletes. This science is also known as kinanthropometry. The knowledge of this science is increasingly being appreciated by the sports administrators. Assessment of human physical performance through anthropometry helps us to evaluate the physical structure and the function of individuals. The knowledge of anthropometry equips us with the techniques of various body measurements like height, body weight, diameters, circumferences and the skin fold thickness which ultimately deals with the assessment of human physique, body composition, physical growth, maturation and gross functions of the body.

The term 'Anthropometry' is derived from the two Greek roots 'Anthrop' means 'man' and 'metric' means 'measurements'. So 'Anthropometry' means the measurement of man, whether living or dead. As the physique plays an important role in sports. So researchers has to identify the factors which are responsible for the dismal performance of sports of sports persons such as physique, physiological, psychological abilities, technique, tactics, physique, body size and body composition which has to be researched from root level. The athletes are recognised and selected naturally on the basis of their body characteristics for a particular sport or an event. It is presumably true that every male and females, begins life with a morphological and functional potentials, which selects limits of health and physical fitness, body shape, composition and bone structure. The total number of muscles and nerve cells are within the body are fixed by birth. International Sports performance in physical competitive sports and games is influenced by the technical, tactical and physical abilities of the players. According to Carter *et al.* (1982) [3], the athletes who wish to achieve success in sports at a high level, should compare their physique with those of the Olympic athletes. Many studies have proved that the individuals who have excelled indifferent sports have specific body type. Individuals who are gifted with specific physique required for the particular game generally excel. It can be said that there is an association between the physique and success in sports.

Objectives of the Study

1. The present study has been designed to obtain information regarding the magnitude and velocity of anthropometric variables and performance in female hockey players of inter-college level. The relationship between the performances with anthropometric variables has also been studied.
2. To find out the difference, if any in the physical performance between hockey players at the inter-college level.
3. To study the difference, if noticeable in selected anthropometric measurements and physical performance of female hockey players of inter-college level.
4. To ascertain anthropometric potentials of player, if remarkable, for formulating a criteria in order to evaluate physical factors contributing towards their performance in hockey.

Methodology

The descriptive method of study was designed and main objective of study was to check the relationship of anthropometric variables of upper limb to the performance of female hockey players of collegiate level. Total forty female (n = 40) hockey players of collegiate level were selected as samples from various colleges of Punjabi university Patiala. The standard technique of Heath and Carter (1967) method was adopted for data collection. The age of subjects ranged between 17 to 25 years. To check the relationship of anthropometric variables of upper limb with the performance of hockey players' standard technique of Heath and Carter (1967) was adopted. The data was analyzed by applying multiple correlation and regression.

Statistical Analysis

To find out the relationship between anthropometric variables of upper limb with the performance of hockey players of collegiate level, the data was analysed by applying, multiple correlation and regression analysis to find out the relationship between selected upper limb dimensions and to predict the performance of hockey players.

Table 1: Relationship of body weight and selected anthropometric variables with hockey performance

Sr. No.	Variables correlated with performance	Coefficient of correlation(r)
1.	Body weight	0.729*
2.	Standing Height	0.780*
3.	Sitting Height	0.156*
4.	Upper Arm Length	0.850*
5.	Fore Arm Length	0.699*
6.	Total Arm Length	0.750*
7.	Hand Length	0.550*
8.	Hand Span	0.659*

N=40
Level of significance 0.05
r.05 (0.38) = 0.313

Table-1 depicts that the co-efficient of correlation of body weight (r = 0.729), standing height (r = 0.780), upper arm length (r = 0.850), fore arm length (r = 0.699), total arm length (r = 0.750), hand length (r = 0.550) and hand span (r = 0.659) were found significant and shows significant positive relation with performance in hockey at 0.05 level of confidence. Whereas sitting height (r = 0.156) showed no significance relation with performance. Thus a hockey player who scored high on performance test have significant relationship with the selected anthropometric variables. It is clear that the increased physical size of upper limb of a player is positively correlated towards increased performance in hockey.

Table 2: Relationship of circumference measurement with hockey Performance

Sr. No.	Variables correlated with performance	Coefficient of correlation(r)
1.	Upper Arm	0.820*
2.	Fore Arm	0.626*
3.	Wrist	0.720*
4.	Chest	0.232*

N=40
*Level of significance 0.05
r.05 (0.38) = 0.313

From table-2 of co-efficient of correlation, it is revealed that circumference measurement have significant correlation with performance in hockey i.e. the upper arm (0.820), fore arm (0.626), wrist (0.720) and chest (0.232) did not showed significant relationship at 0.05 level.

Table 3: Relationship of body diameters with hockey performance

Sr. No.	Body diameters correlated with performance	Coefficient of correlation(r)
1.	Hand diameters	0.626*
2.	Wrist diameter	0.759*
3.	Humerus biocondylar diameter	0.632*
4.	Biacromial diameter	0.504*

N=40
*Level of significance 0.05
r.05 (0.38) = 0.313

It is obvious from the values of table-3 that the diameters of hand (0.626), wrist (0.759), humerus biocondylar (0.632) and biacromial (0.504) respectively were found significant at 0.05 level and have positive correlation with the performance in hockey. Thus the results speak of significant relationship between the measures of performance and selected four diameters.

Table 4: Relationship of skinfold measurement with hockey performance

Sr. No.	Skinfold measurements correlated with performance	Coefficient of correlation(r)
1.	Biceps	0.691*
2.	Triceps	0.724*
3.	Subscapular	0.799*
4.	Supra-illiac	0.724*

N=40
*Level of significance 0.05
r0.05 (0.38) =0.313

The results of table-4 of co-efficient of correlation between skinfold measurements and performance in hockey exhibits that there is significant correlation between skinfold measurements at biceps (r = 0.691), triceps (r = 0.724), subscapular (r = 0.799) and supra-illiac (r = 0.724) were found significant at 0.05 level of confidence.

Table 5: Combined contribution of selected anthropometric variables of upper limb with hockey performance

Dependent(criterion) variable(Ye)	Independent variables(X's)	Selected Independent variables for multiple correlation(X's)	Coefficient of correlation(r)
Performance in hockey	Body weight (X1) Total arm length (X6) Fore arm circumference (X9) Wrist circumference (X10) Humerus bicondylar diameter (X15) Biacromial diameter (X16) Biceps skinfold (X17) Subscapular skinfold (X19)	Total arm length (X6) Fore arm circumference (X9) Humerus bicondylar diameter (X15) Subscapular skinfold (X19)	0.7508*

N=40
*Level of significance 0.05
r.05 (0.36) = 0.438

It is observed from table-5 that the combined contribution of total arm length, fore arm circumference, humerus biocondylar diameter and subscapular skinfold are significantly related to performance in hockey as the computed value of (r = 0.7508) is more than the tabulated value (0.4378) at 0.05 level of confidence with 36 degree of freedom. From the obtained value of r, it is assumed that total arm length, fore arm circumference, humerus biocondylar diameter, subscapular skinfold together contribute to the prediction of performance in hockey.

Table 6: Multiple regression analysis of selected anthropometric variables and performance in hockey

Dependent variable(Ye)	Selected Independent Variables for Multiple Regression Analysis	Regression Co-efficient (Rx)	Multiple Co-relation (R)	Determinant of Multiple Co-relation (R^2)	Percentage of each variable
Performance in Hockey	Total Arm Length (X6)	+0.0231	0.7508	0.5673	25.60
	Forearm Circumference (X9)	+0.5420			10.54
	Humerus Bicodylar Diameter (X15)	+0.3891			14.25
	Subscapular Skinfold(X19)	+0.0627			5.98

Bo (constant)=0.54816 S.E. of Estimate=1.19531

PCX = [Beta Weight]×[r]×[100],where beta weight = $B \times \frac{\text{S.D. of X}}{\text{S.D. of Y}}$

And r = co-efficient of correlation between X and Yc

Contributions of total arm length, fore arm circumference, humerus biocondylar diameter and subscapular skinfold (predictors) towards multiple co-efficient of determination R^2 are 25.60, 10.54, 14.25 and 5.98 percent respectively.

Discussion of Findings

The present study was based on the hypothesis that there exist significant relationship between selected anthropometric variables and combination of two or more selected anthropometric variables of upper limb to the performance of female hockey players of collegiate level.

Conclusions

It was observed that there was a significant relationship between the anthropometric variables of upper limb and performance of female hockey players of collegiate level.

References

1. Ambegaonkar SD, Dikshit YB. Assesment of Physical Fitness of Indian Hockey Performance Ind. J Med. SC. 1964; 18:15.
2. Bhatnagar DP, Singal P. A comparative study of athletes and volleyball players from Ruralarea of Assam and M.P. Modern Prospectives in Physical Education in Sports Science.- Harnam Publications, 1986, 117-123.
3. Carter JEL. _Physical Structure of Olympic Athletes Part-1. The Montreal Olympic Anthropological Project. S.Kargar, Basel, 1982.
4. Cureton TK Jr. Physical Fitness of Champion Athletes. University of Illinios Press, Urban, 1951, 49p.
5. Kaur, Sidhu. "In their paper presented at Fourth Congress International Auxalagy, Montreal, Canada, 1975.